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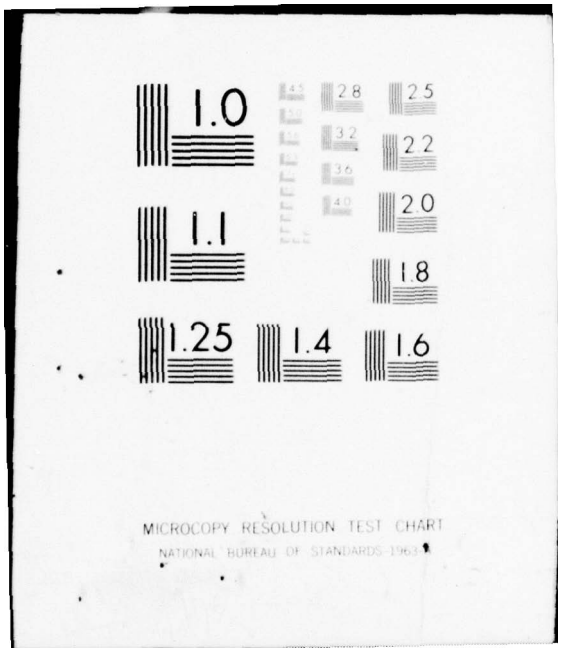
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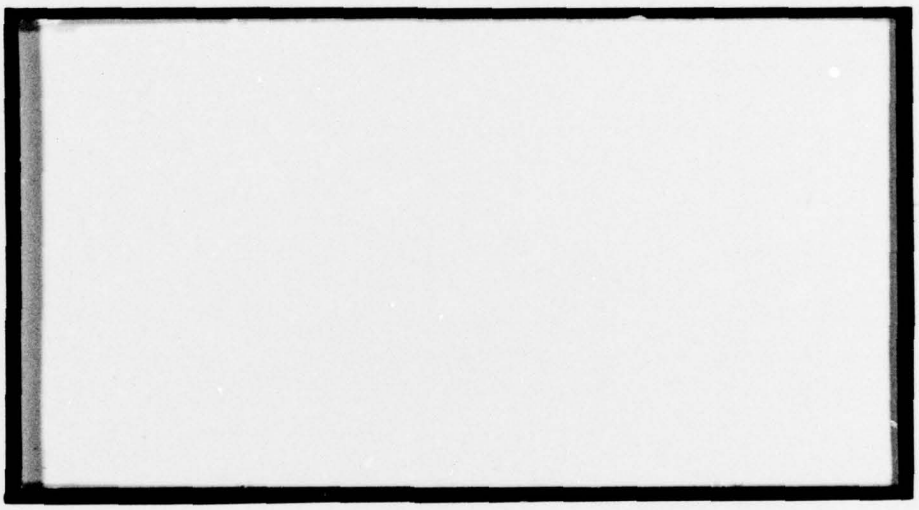

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ORGANIZATIONAL AND INDIVIDUAL CHARACTERISTICS, ORGANIZATIONAL CLIMATE, AND JOB ATTITUDES: A MULTIVARIATE INVESTIGATION OF RESPONSES AT INDIVIDUAL AND GROUP LEVELS OF ANALYSIS

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Technical Report 77-1

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Questionnaire data were gathered from 396 employees in 15 stores of a large international retail merchandising organization. The questionnaire included demographic and organizational position items, an organizational climate measure and a job attitude instrument. The individual data were aggregated at the work group level to form group summary variables for 87 work groups. Canonical analyses were conducted in order to examine the relationship between positional, demographic, climate and attitudinal variables. These relationships were examined at both individual and group levels of analysis. Redundancy

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indices were used to summarize the relationships between the distinct variable sets. Climate was found to be slightly more predictable from positional variables while job attitudes were more predictable from demographic variables. Using demographic and positional variables in combination, climate was more predictable than were job attitudes. The same pattern of relationships was found at the group level of analysis. As expected, the group level relationships were much stronger than those obtained at the individual level. The results are discussed in view of recent theoretical and empirical work on organizational climate in which it has been suggested that climate represents a set of shared perceptions at some level above that of the individual.

Abstract

Questionnaire data were gathered from 396 employees in 15 stores of a large retail merchandising organization. The questionnaire included demographic and organizational position items, an organizational climate measure and a job attitude instrument. The individual data were aggregated at the work group level to form group summary variables for 87 work groups. Canonical analyses were conducted to examine relationships between positional, demographic, climate, and attitudinal variables. These relationships were analyzed at both individual and group levels. Redundancy indices were used to summarize the relationships between the distinct variable sets. Climate was found to be slightly more predictable from positional variables while job attitudes were more predictable from demographic variables. Using demographic and positional variables in combination, climate was more predictable than were job attitudes. The same pattern of relationships was found at the group level of analyses. As expected, group level relationships were much stronger than those obtained at the individual level. The results are discussed in view of recent work on organizational climate which has suggested that climate represents a set of shared perceptions at some level above that of the individual.

The proposition that behavior is a function of characteristics of the person and the environment is a truism. This basic assertion can be traced back to Aristotle (cf. Lichtenstein, 1973), but the writings of Lewin (1936, 1951) made it central to present day psychology. If we reject it, we are left with very little to study. If we accept it as a working framework, we will direct our research efforts to find variables which describe environments and persons and which have reliable relationships with responses as well.

It has been within this framework that the pseudo-controversy over situationalism/personalism in the causation of behavior arose (Bowers, 1973; Ekehammar, 1974; Golding, 1974; Mischell, 1973). Some psychologists were convinced that either personality variables or situational variables were in dominant control of human behavior. Ekehammar (1974) in an extensive review of the controversy argues that the tests of the hypotheses related to the issue were generally one-sided (ANOVA favoring personalism, regression favoring situationalism). Further, careful choices of individual characteristics, characteristics of environments, and responses studied can determine which set of characteristics predominates in the control of behavior or other responses. Little real knowledge was gained until researchers began to ask different questions: What responses are related systematically to which set of characteristics?

Despite problems with the measurement of strength of effects, the trend of recent results has been supportive of the interactionist position (Ekehammar, 1973). These issues have been raised primarily among personality psychologists. Many researchers in organization/industrial psychology fail to see the direct relevance of such research for the study of behavior in organizations. Organizational researchers happily pursue better taxonomies of jobs (McCormick

& Tiffin, 1974), organizations (Payne & Pugh, 1975), and abilities and skills (Guilford, 1967; Fleishman, 1975) with little notion of the relevance of the taxonomies for behaviors. Other than Dunnette's (1966) attempt to consider seriously interactions in the area of selection, few have considered explicitly person and environment interactions. One other recent attempt is that of James, Jones, Bruni, Hornick & Sells (1975a) in their investigations of the impacts of environments on people in organizations. (This and other work will be discussed later.)

Hulin and Roberts (1974) have restated the Lewinian formulation to make it a useful operational perspective for organizational research. The essence of this statement is to extend $B = f(p,e)$ to $R = f(U, E, U \times E)$,

where: R = vector of responses,

U = vector of variables describing the unit of interest (individual, group, department, etc.),

E = vector of variables describing the environment.

Two aspects of this modification are important. First, by extending the Lewinian conceptualization beyond the individual level of analysis, we are able to explore relationships for which individual data are not available or not appropriate. Division performance, office sales, or ship effectiveness may not at all be attributable to the sum of individuals' responses but rather are the results of interacting groups. Where such data exist, group level variables are required to describe the units of interest and more macro-level data are required to describe characteristics of the groups' environments. Second, the term $U \times E$ explicitly expresses the notion that interactions among the two sets of characteristics are potentially an important source of response variance. This term and the explicit multivariate nature of the other vectors introduces

the need to consider more elaborate designs and complex methodologies which allow us to assess the effects of various interactions.

Since Lewin there has been disagreement as to the nature of environment which is presumed to influence behavior. There is little consensus on the question of whether the E vector should be the objective environment, the subjective perceived environment, or perhaps some elements of both. While we may assume that only that which is perceived can influence behavior, operationally this leads to serious problems in interpretation of data. The results from repeated use of method-bound-methodologies with correlated error on both sides of our equations provide a weak basis for theoretical development.

Herman and Hulin (1972), Herman, Dunham and Hulin (1975), and Newman (1974) have demonstrated relationships between variables which reference situational differences and attitudinal differences. One value of this approach is that it is not subject to capitalization on method variance of response-response relationships which have often been the case with environmental, climate and attitude research. This use of non-psychological variables to reference situational differences appears to be a fruitful means of avoiding the method variance pitfall. Unfortunately it also introduces problems of interpretation since we have but poor specification of processes through which characteristics of environments are translated into response tendencies.

Psychological and organizational climate have been discussed extensively (James & Jones, 1974; Howe & Gavin, 1974) as variables which represent individuals' perceptions of work environments. When measured as perceptions, climate represents more than a set of purely cognitive pictures of the objective environment. Rather, the individual's perception of an immediate as well as not so immediate environment is a result of the objective environmental

characteristics being filtered by particular personal characteristics including differences referenced by sex, age, race, socio-economic status, etc. Climate perceptions thus result from a screening of the objective environment, this screening being subject to filtering, leveling, and sharpening as a result of an individual's life history.

Schneider (1975) makes a distinction between perceptions of the environment and evaluations of it. He suggests that evaluations are strongly influenced by personal characteristics while perceptions are not. Perceptions are more directly related to one's real immediate environment. Thus we might expect a set of climate perceptions to be more predictable from objective variables which reference the objective environment than from those which reference individual characteristics. Newman (1974), and Herman and Hulin (1972) have demonstrated that a class of variables descriptive of organizational positions are more predictive of climate and job attitudes than are individual differences of incumbents of those positions. In other studies where this is not the case George & Bishop, 1971), we note that individual variables were, in fact, pencil and paper scales which share an unknown amount of method variance with pencil and paper climate measure. The use of objective variables to reference both the domains of personal and organizational variables offers one solution to this problem.

The above discussion assumes an individual level of analysis. An argument has been presented by Schneider (1975), and James and Jones (1974) for climate to be conceptualized at some level more macro than that of the individual. The problems involved in aggregation-disaggregation have been discussed by Hulin and Roberts (1974), Cronbach (1976), and Hannan (1971). Regardless of the problems of appropriate level, appropriate statistics, and within group variance, if we consider organizational climate as a construct which characterizes

sub-units within the organization larger than individual employees, we must attempt to combine individual perceptions into a measure which represents the organization or unit from which the data were aggregated. Thus, some sort of aggregation within work groups, units, or organizations seems appropriate for climate measurement.

Where one works makes a difference in responses (Dunham, 1975). Just as one's physical location on the earth affects what meteorological climate will be experienced, one's location in the organization, referenced by both vertical and horizontal positioning, affects what climate will be perceived. The organizational variables used in previous research by Herman (1972), Herman and Hulin (1972), Herman, Dunham, and Hulin (1975), and Hulin, Hom and Herman (1976) all reference one's place in organizational space and demonstrate attitudinal differences associated with organizational positioning. Given the conceptual similarity of job attitudes and climate, we would expect similar results with climate. Such differences have been previously demonstrated by Newman (1974), James and Jones (1975), and Lawler, Hall, and Oldham (1974). The present study is part of a research program which has identified several important sources of attitude variance. The same sources have been partially investigated with respect to climate variance (Newman, 1974). What we present here is in part a replication of Newman's study as well as an extension of that approach to the group level of analysis.

The utility of a psychological construct can be evaluated in several ways. Perhaps the most important is that the proposed construct has demonstrated relationships with other constructs for which places in a nomological network have been demonstrated. As important as this basic requirement is, we must be just as concerned with the degree to which a proposed construct is distinguished empirically from other constructs. To the degree that the research on climate

specifies both its meaning and uniqueness, we can begin to consider its use in developing organizational theories.

Repeated work has demonstrated that a climate of simulated organizations (Dieterly and Schneider, 1974; Frederickson, 1962; Lewin, 1951) can be related to performance and satisfaction. Other work has shown climate to be related to organizational structure and personality variables (Gavin, 1975; James & Jones, 1974). The survey can go on, but need not. We only wish to demonstrate that a place for climate in nomological networks appears quite secure. At this point, the second question becomes crucial. This question, raised by Guion (1973) and Johannesson (1973) considers the uniqueness of the construct. Indeed, if we are simply relabeling presently used and well worn concepts, any apparent progress is illusory. Thus far, the data on the satisfaction-climate issue is equivocal. The cluster analysis used by Johannesson (1973), while elaborate, is not at all a strong basis for drawing conclusions about underlying dimensions of measures. The investigation of the question by Lawler, Hall and Oldham (1974) yielded equivocal results as a result of severe restriction in range of organizational characteristics. LaFollette and Sims (1975) have argued that climate is unique from job satisfaction because of differing patterns of relationships with performance and organizational practice measures. While an interesting test of the redundancy hypothesis, exclusive use of simple correlations in making judgments about redundancy without regard to multi-collinearity weakens the interpretations made.

Recent reviews of climate research (James, Jones, 1974; Heilriegal and Slocum, 1974) have summarized adequately the available research. (We mention only a few of the recent studies which have bearing on the questions we approach in this research.) Lawler, Hall, and Oldham (1974) investigated the relationship between organizational structure, process (i.e., assignment specificity, budget allocation, performance-pay contingency), performance, satisfaction, and

climate. They viewed climate as an intervening variable which mediates the relationship between process and structure and the two outcomes of performance and satisfaction. The results were interpreted as indicating that structure was not generally related to climate while process variables were. Climate was in this study assessed at the individual level and aggregated for analyses at the organizational level. Several reasons were given for the lack of organizational structure-climate relationship. Little variance on the structure measures, high levels of missing data and type of organization may be reasons for the failure of structural measures to be related to climate.

The structural measures used by Lawler et al are different from those used by Newman (1974) in a study in which he found structural-positional variables to account for moderate amounts of climate variance. It may be that the tradiational variables used to describe organizations--size, tall-flat, span of control--are not the best characteristics of organizations to use in such studies. Perhaps we should instead use variables which describe the position of the person or unit within the organizational structure. Newman found that variables which define a person's location in the organization do account for perceived work environment (climate)variance, thus climate perceptions were to some degree shared by persons in given levels, departments, functions, etc. If this inter-organization differentiation in fact exists, organizational climate is perhaps a meaningless term, the use of which serves only to mask more interesting unit level shared perceptions. Thus we follow Schneider's (1965) conception of climate as shared perceptions at some organizational position and level.

Gavin (1975) addressed the same problem of the effects of individual differences, organizational structure and their interaction on climate perceptions.

The structural variables used were the traditional set of organizational variables and these were cluster analyzed yielding three clusters of organizational position type. Biographical information was also cluster analyzed and yielded 3 "homogeneous" clusters of persons. A 3 X 3 MANOVA was then used to analyze the climate scales as dependent variables. The results indicated main effects for both personal characteristics and organizational characteristics but there was no significant interaction as hypothesized. Both variable clusters were able to account for small but significant portions of variance in climate perceptions. While the study was an example of what seems to be the appropriate multivariate methodology, the nature of the clustering and variables included do not provide an answer to the question of how much unique variance is a result of the two variable sets.

Jones, James, Bruni, Hornick & Sells (1975) investigated climate within the "linkage model" (Indik, 1968) following the general philosophical perspective of interactionism. Climate is in their view best considered at two levels: at the individual level--psychological climate, and at the organizational level--organization climate. Jones et al. (1975) report the development of a climate measure and the results of an investigation of variables related to climate. The central analysis consisted of a series of multiple regression analyses of the predictor sets (contextual, structural, intended resource, position) on each climate dimension. The results indicated that small but significant relationships existed between climate and all predictor sets. Individual resource and position variables were found to have somewhat stronger relationships with climate than did structural and contextual variable sets. Multiplicative terms were used to capture variance due to interaction among situational variables. The authors suggest that the improved prediction of climate components by the total set of variables over that achieved by the use of only

structural and contextual sets supports the interactionist position. That may be over-interpretation since the improvement of R^2 by adding the multiplicative terms is slight (although significant--due to large N). It can also be noted that no cross validation was reported in the multiple regression, nor were any adjustments made for shrinkage of the R^2 upon generalization to other samples from the same population.

James, Jones, Bruni, Hornick, & Sells (1975) report another study in which they investigate further the relationships among numerous variables and climate. This study focused primarily upon the prediction of performance-effectiveness criteria. Climate measures were used as predictors in regression analyses. The results are unclear since a high degree of multi-collinearity among the criteria makes the interpretation difficult as well as raises doubts about the overall significance of such a large number of related univariate tests. However, James et al. (1975) were able to use aggregated data from their many samples and could make some useful statements about agreement-disagreement at various levels of aggregation.

In summary, methodology has improved recently but results are still not clear regarding the utility of climate. While it is rare that a single study will make or break a construct, the cumulative pattern of results indicates an uncertain prognosis for organizational climate. The present research is one more attempt to test empirically the utility of this construct on a different population using different methods of analysis from previous research.

If we begin to consider climate at a work group level, we are obligated to attempt to relate it to other variables assessed or aggregated at the same level (Roberts & Hulin, 1974). It is at this point that confusion can result. What were previously considered to be individual characteristics are averaged

and called group characteristics. Yet, sex of an individual means something different from sex composition of a group. But just as we can define a vector of characteristics descriptive of an individual, and locate that person in p-dimensional space, nearly all of these p-dimensions can be aggregated to yield a U vector which summarizes information about individuals in the group. The new variables which describe units (composed of individuals) may then be used to predict other variables of interest. Thus, if we are considering the notion of climate as shared perceptions, we should consider the unit characteristics of groups hypothesized to share such perceptions. One obvious concern is the question of agreement. In the area of leadership, the "averaging model" has been questioned and empirically challenged (Graen, 1975). The assumption that the mean, or median perceptions of leader behavior best represents the leader's actual behavior has been shown to be untenable. (While it may be the case that differential treatment of group members by a supervisor affects climate perceptions--especially with respect to leadership--the degree of differentiation will directly affect the predictive power of the individual level of analysis, inflating the within group variance at the expense of between group variance.)

In this study we report the results of a series of analyses which attempt to assess the utility of climate. Multivariate techniques are used in order to draw conclusions about composites of variables rather than individual variables. The first set of analyses reports the results of factor analyses on both individual and group level climate data. The second set of analyses investigates the multidimensional relationships among demographic measures, positional variables, climate, and attitudes. The results should indicate the place of climate as an intervening variable within this limited network which also contains the construct of job satisfaction.

Another set of analyses will explore climate as a group level concept.

The relationship between group composition (unit characteristics), location of the group in organizational space, and climate and attitudes will be examined. Here we expect that a dummy coded variable reflecting group identification will be more predictive of measures of climate than the summary of individuals which denote the composition of the group. Schneider (1975) has argued that climate must be tested as a set of perceptions shared by individuals at some organizational location. The degree to which persons within groups share common perceptions of their environments and the degree to which these perceptions differ from others, will in part determine the utility of this operationalization of climate.

A note is in order concerning the type of multivariate analyses conducted. Relationships between variables in organizational research have traditionally been evaluated using bivariate or multiple regression techniques with each of a series of criterion treated independently of the others. While such procedures yield results which are easy to interpret, they afford little assistance in understanding the complexity of behavior. Complex phenomenon cannot be studied adequately with simple univariate techniques. Analytic tunnel vision has blinded researchers to a limited set of analytic tools and this has served to reduce the complexity of phenomenon to a level consistent with that of available methods. We argue for the knowledgeable use of multivariate techniques in organizational research. Only by building complexity into our methods of analysis can we hope to understand the complexity of the real world.

Method

The data were collected from full-time retail sales employees in 6 departments of 15 stores in the Midwest of a large international merchandising organization. Personnel managers from each store received a letter from the company survey research director explaining the purpose and nature of the study.

All employees in the sample stores also received a letter explaining the study and emphasizing the confidentiality of the questionnaire. Personnel managers administered the questionnaire to employees in their stores. Questionnaires were then mailed directly to the researchers by the employees. The response rate was 92%. A total of 396 employees responded to the questionnaire. The aggregation resulted in data on 87 groups. Groups were identified as including employees reporting to a division within a store.

The Questionnaire

The questionnaire contained several sections which assessed a variety of individual, organizational characteristics as well as attitudes, climate, and motivation. The first section included the standard demographic items and company position characteristics such as store department, level, and tenure. Socio-economic status was determined using the Hollingshead (1965) measure. The second section of the questionnaire included the five JDI satisfaction scales (Smith, Kendall, & Hulin, 1969), and the GM Faces scale (Kunin, 1955). Of central importance in this study were a set of items intended to be a developmental measure of organizational climate. Following Schneider (1975), climate was operationalized as a set of descriptive items which may describe the work environment. Sixty items were written, based on previous attempts to develop a climate instrument (Kendall, Note 1).

The items were generated using seven a priori dimensions: communication, physical environment, supervision, task, decision making, interpersonal atmosphere, and rules-rewards systems. Factor analyses of the 60 items yielded three dimensions and items with high loadings ($\geq .35$) were combined into scales using unit weights.

The data were analysed using canonical regression (Cooley & Lohnes, 1971). Canonical regression procedures define a series of linear combination of both

predictors and criterion variables such that the two composites are maximally related, subject to the restriction that each successive pair of composites is uncorrelated with the previous set. Because the relationships between predictor and criterion sets are maximized, the common interpretation of $\underline{R}^2_c$ as variance accounted for is misleading, and over-estimates on estimate of the strength of the relationship in the population. A more desirable indicator of the relationship is the redundancy index (Cooley & Lohnes, 1971). As with other multivariate techniques, standard significance tests on the canonical correlations are only one consideration. A more important means of evaluation is the stability of the composites. Internal cross-validation was used for the analyses to provide a minimum basis for determining stability. The sample was divided into a 2/3 derivation sample and a 1/3 validation sample and weights derived on the larger group applied to the smaller portion of the sample. Correlations between the resulting pairs of variates were tested for significance. Only those canonical correlations which were stable upon cross validation are reported. For interpretation in the case of the group level analyses where small Ns made strict significance testing undesirable, a less severe standard of stability was used. The interpretation of the results is for all analyses based on the total sample. In order to interpret the results of the canonical analyses, we construct structure matrices which contain the correlation of the original variables with the variates. These elements can be squared to develop a variance matrix from which the redundancy index is computed. The redundancy indices computed on the basis of only significant variates will be misleading. In order to insure the capability of comparisons of these variance estimates, all canonical variate pairs are included in computation of the redundancy indices for the analyses. This is consistent with the computation of $\underline{R}^2$ based on all predictors rather than on only the significant $\underline{\beta}$-weights. As demonstrated

by Thorndike and & Weiss (1973), structure matrices are less severely affected by the covariation among variables than are the derived weights. Where the predictor variable was dummy coded (Cohen & Cohen, 1975), the multiple correlations were used in the structure matrix for interpretation.

Results

Factor Analysis of Climate Items

A factor analysis of the 60 climate items using a Jacobi roots and vectors routine was computed using the total sample. Table 1 contains the results of this analysis. The relative sizes of the eigenvalues indicated the presence of at least three factors. Orthogonal rotation (varimax) of three factors to approximate simple structure yielded a matrix of factor loadings which contained 33 items which were complex in their loading structures. These items were dropped and a second factor analysis computed on the remaining 27 items. The results of this analysis are presented in Table 2. The analysis yielded 3 interpretable factors. Fifteen items formed a factor labeled Managerial Openness and Employee Participation. All of these items concerned the degree of openness in supervision, amount of employee input encouraged, and the openness to innovation. The second factor contained six items. This factor was labeled Rationality-Structure and dealt with the degree to which structure is imposed, the closeness of supervision and the emphasis on efficiency. The third factor contained six items dealing with the physical work environment or setting. This factor was given the label Physical Environment.

Insert Tables 1 and 2 About Here

Two factor analyses were also computed on the work group means on the climate items. Due to the reduced N relative to the number of items, the 60 items were divided into two overlapping, 37 item sets. Fourteen items were common to both sets and were selected on the basis of their loadings in the individual level data analysis. Separate factor analyses and rotations were computed for the two 37 item sets. Results are shown in Table 3. The resulting loadings provided the basis for dropping 23 items which did not load on any single factor. The remaining 37 items were then used in a second factor analysis using the 87 groups. A rotation to the varimax criterion of three factors provided the basis for interpretation. Twenty items loaded on the first factor.

Insert Tables 3 and 4 About Here

These items included all of those previously labeled in the individual level analysis as Managerial Openness-Employee Participation. The same label is retained for the group level factor. The second factor contained 5 items dealing with the physical work setting. As before, we labeled this factor Physical Environment. The third factor was primarily made up of 6 of the items included in the individual level factor Rationality-Structure as well as two other closely related items. A summary of the factors and item loadings is presented in Table 4.

While no statistical test yielding exact α-levels is available, these results indicate that the factor structure appears consistent across levels of analysis. For the most part, the same items combined to form the three factors at both individual and group level of analysis. A few items were added in the group factor solution. It should be noted that the ordering of the factors (reflecting relative variance accounted for) changed from the individual to

the group level of analysis. Physical environment emerged as the second factor and rationality-structure as third in the group solution. Since the relative size of the eigenvalues associated with these factors are rather similar, little importance is attached to this reversal.

We are well aware that this step by step procedure for extracting meaningful variance from the 60 climate items capitalizes on chance to a certain extent. If our aims were to make statements about the dimensions of climate, or even about the dimensions of underlying covariation among this particular set of 60 items, the procedures used would be totally inappropriate. Such was not our intent. We were attempting to summarize the maximum meaningful variance contained in the original 60 items we had written to assess differences in organizational climate using the fewest number of dimensions in order to preserve degrees of freedom.

Based on the loadings from the factor analyses, the items were combined into scales using 0, .5, 1.0 weights for loadings which were $< .20$, $\geq .20$ but $\leq .40$, and $> .40$ respectively. The loadings from the individual and group factor solutions were used to derive both individual and group climate scores. These scores were then used as the dependent variables in the canonical analyses of the climate measures.

Canonical Analyses of Individual Data

The first set of analyses were conducted in order to determine the place of climate within the context of other variables. Analyses were conducted using positional characteristics, demographic characteristics, and both variable sets as predictors with attitudes and climate as dependent variable sets. In all cases, internal cross validation procedures were used to determine the stability of the canonical composites. Only those variates with significant cross-validation correlations were used for interpretation.

Positional characteristics predicting climate. The results of the positional characteristics by climate analysis are summarized in Table 5. The interpretation of the variates is made through examination of the upper left and lower right quadrants of the structure matrix. The first canonical variate of predictors was primarily made up of division differences and to a lesser extent, store differences. For the criterion, the first variate is composed of primarily physical environment, and to a lesser degree, rationality-structure. This first set of relationships reflect the physical differences among divisions and among stores. The second pair of canonical variates is composed primarily of store variation as well as job level differences on the predictor side , and managerial openness and employee participation on the criterion variate. The second relationship appears to reflect differences in perceptions of the degree of managerial openness by employees in various stores and between managerial and non-managerial personnel. Managerial personnel view the climate as more open, with more participation than do non-managerial personnel. The two predictor variates are able to account for 13.7% of the total climate variance. When variance accounted for by the final variate is added, this increases to 15.4%.

Insert Tables 5 and 6 About Here

Demographic characteristics predicting climate. The results of the demographic characteristics by climate analysis are shown in Table 6. The first pair of variates included differences related to sex and to some extent age and number of dependents on the predictor variate and physical environment on the

criterion side. Females and younger workers perceive less adequate physical environment and to a lesser extent, structure than do older male workers. The single significant canonical correlation accounted for 4.7% of the total climate variance. With the additional variance retained by the remaining canonical correlations, 8.9% of the climate variance is accounted for.

Positional and demographic characteristics predicting climate. The third analysis used all predictors combined in the prediction of climate. The results appear in Table 7. This analysis provides information from which the unique variance due to either variable set may be estimated. Division, store, and sex defined the first predictor variate (in that order of importance). The first criterion variate was made up of physical environment and to some degree rationality-structure. The interpretations are the same as those given to the analyses of the separate predictor sets. The second predictor variate included level (supervisory-nonsupervisory), store, and division differences. Demographic variables consistently had small loadings on the variates. The second criterion variate was made up of managerial openness-employee participation and to some extent physical environment. Again the interpretation is consistent with that given for the separate analyses.

When combined variable sets are used simultaneously, the positional characteristics prevail in accounting for climate variance. When the redundancy index is computed, we find that the two variates of combined variable sets are able to account for 19.8% of the climate variance. Inclusion of variance accounted for by the third variate increases this estimate to 22.4% of the total variance. Using the redundancy indices from the analyses above, estimates of unique variance related to demographic characteristics and positional characteristics can be obtained. The positional variables were uniquely related to 13.5% while demographic characteristics uniquely accounted for 7.0% of the climate

variance. Thus we find that structural or positional characteristics are most related to the climate measures as hypothesized by our tentative climate model.

We now turn to the relations of the same predictor variables to attitudes. If climate is an intervening variable between positional characteristics and attitudes, we expect to find less of a relationship between positional characteristics and attitudes than positional characteristics and climate. We also would expect that demographic variables will not improve the predictive efficiency to any major degree.

Insert Tables 7 and 8 About Here

Positional characteristics predicting job attitudes. The results of this analysis are summarized in Table 8. Using positional characteristics as predictors of job attitudes, two significant pairs of variates were determined. The first predictor variate consisted primarily of store differences. The criterion variate included satisfaction with pay and satisfaction with promotion. This linear combination appeared to reference store differences in satisfaction with pay and promotion. The second predictor variate was composed of division and store differences in that order of importance. The criterion variate included satisfaction with work, supervision, pay and co-workers as well as job involvement and focus of motivation. The two significant and stable predictor variates were able to account for 7.1% of the attitude variance. The additional canonical variates increased this estimate to 11.5%.

Demographic characteristics predicting job attitudes. The results of this analysis appear in Table 9. Only one of the significant variate pairs indicated stability upon cross-validation. The predictor variate included age, marital status, and race. This variate was most related to a variate including experi-

enced motivation, job involvement, focus of motivation, pay satisfaction, work satisfaction, and general satisfaction. The motivation scales were most important elements of the criterion set. Older employees and married employees tend to report more motivating job experiences than others. Differences in the

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Insert Tables 9 and 10 About Here

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same dependent variables are also related to race. The variate pair was able to account for 5.2% of the attitude variance. The additional canonical variates increased this estimate to 9.1%.

Positional and demographic characteristics predicting job attitudes. The results of this analysis appear in Table 10. The combined predictor sets are used to estimate the unique variance due to each set of variables. Only two of the statistically significant variates were somewhat stable upon cross-validation. The first predictor variate included store differences, age, marital status and tenure. The criterion variate related to it included promotion and pay satisfaction and general satisfaction. The second pair of variates included store, age, tenure, and sex as predictors. Supervision and work satisfaction, job involvement, focus of motivation, experienced motivation formed the criterion variate. These linear combinations indicate a complex relationship between motivational and satisfaction responses, age related experiences and store differences. The two stable pairs of variates accounted for 11.7% of the attitude variance. With the addition of the remaining canonical variate, 20.5% of the total attitude variance was accounted for.

Using 20.5% as an estimate of the predictive ability of the given variables sets, we need only subtract the variance accounted for by each particular variable

set from the total to estimate the unique variance attributed to the remaining variable set. Thus 11.4% of attitude variance is uniquely accounted for by positional characteristics and 9.1% by demographic characteristics. Comparing these estimates with those made for climate, the results indicate that predictability of climate is slightly better than that of job attitudes. We also note a stronger relationship between structural-positional characteristics and climate than between demographic variables and climate.

Job attitudes and climate. The results of the canonical analysis of job attitudes and climate appear in Table 11. Linear combinations of attitudes were able to account for 41.2% of the climate variance, but because of the asymmetry of these variable-variate relationships, climate variates account for 21.4% of

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Insert Table 11 About Here

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the variance of the attitude variables. The strongest relationship was between work and supervision satisfaction and Managerial Openness-Employee Participation.

Canonical Analyses of Group Level Data

The analyses reported to this point have all been conducted on individual level data. One question raised in the literature (Schneider, 1975; James et al., 1975) has been the nature of climate as a group level construct. In order to attempt to evaluate the place of a group level conceptualization of climate, similar analyses to those previously reported were conducted using the group level data.

Positional characteristics predicting group aggregated climate. The results of this analysis appear in Table 12. Positional-structural variables included were able to account for 15.8% of the climate variance at the group level. With all additional canonical variates added, 33.8% of the total climate variance is accounted for. Division differences predominated in the single significant

predictor variate with store differences also adding variance. The criterion variate was primarily group climate II-physical environment, and to a lesser extent rationality structure (Group Climate III). It appears that divisions and stores possess unique and varied environments, and vary as to the amount of structure imposed on employees.

Insert Tables 12 and 13 About Here

Group demographic characteristics predicting group aggregated climate. Group composition (or summary demographic) variables were used to predict climate. The results of this analysis appear in Table 13. While the canonical R is lower than that of the previous analysis using individual demographics to predict climate, the redundancy index is large. Approximately 22.3% of the climate variance is accounted for by group composition using only the significant variates. This results from the difference in meaning of the two coefficients. The predictor variate was composed of mean age, proportion married, proportion caucasian, mean number of dependents and proportion male. This variate was most strongly related to perceptions of the physical environment.

The second criterion variate was composed of managerial openness-employee participation. Groups which have persons from urban backgrounds and higher education levels perceive a climate of greater openness and opportunities participation by employees.

Positional and group demographic characteristics predicting group aggregated climate. The results of this canonical analysis appear in Table 14. When both predictor sets are used simultaneously, 41.4% of the climate variance is accounted for by two stable linear combinations of predictors. The inclusion of the additional canonical variate increases this estimate to 47.9% of the climate variance. The first predictor variate was composed primarily of division and store differences,

mean age, proportion married and mean number of dependents had somewhat smaller loadings on the predictor variate. This composite was most strongly related to a linear combination of physical environment and reationality-structure climate measures. The second predictor variate was primarily composed of store differences, with division level and mean urban-rural background having smaller contributions. This linear composite was most related to managerial openness-employee participation.

To summarize, at the group level we found that positional-structural variables were able to account for 33.8% of the climate variance. Group summary demographic variables were able to account for 23.6% of the climate variance. The combined variables accounted for 47.9% of the climate variance at the group level of analyses.

If climate acts as an intervening variable at the group level of analysis, as previously suggested, we should find that climate is more closely related to positional-structural variables than are job attitudes. Climate then should be more predictable from non-psychological positional-structural variables than are job attitudes. With the intent of examining these questions, the demographic and positional-structural variables are used to predict job attitudes.

Positional characteristics predicting group aggregated job attitudes. The results are shown in Table 15. Using the positional variables as predictors of job attitudes, two of the significant variates were found to be stable upon cross validation. The first predictor variate referenced store differences and to some extent division differences. The first criterion variate was primarily composed of pay satisfaction and general satisfaction. Promotion and coworker satisfaction were included at a minimal level. This composite attitude appears to define the set of variables on which stores differ most. The second predictor variate was made up of primarily division differences with store and level

loading at a lower level. This particular combination predicted a composite of job involvement, focus of motivation, satisfaction with supervision and work. The two stable criterion variates were able to account for 15.9% of the group attitude variance. When all canonical variates are included, 33.8% of the total attitude variance is accounted for.

Group demographic characteristics predicting group aggregated job attitudes. Results are shown in Table 16. The summary demographic variables formed two significant and stable composites predictive of job attitudes. The first predictor variate was composed of proportion of the group who were married, mean number of dependents, proportion male, and proportion Caucasian. This complex variate predicted a composite made up of general satisfaction with coworkers. The second predictor variate pair included mean tenure and proportion married. This composite was predictive of a combination of work and promotion satisfaction. Using the summary demographic characteristics of the group as predictors, composites were able to account for 17.3% of the variance in job attitudes. The inclusion of all additional canonical variates increased this estimate to 23.6%.

Insert Tables 16 and 17 About Here

Positional and group demographic characteristics predicting group aggregated attitudes. Results are shown in Table 17. The analysis using the combined variables sets yielded two stable pairs of variates. The first predictor variate was composed of store, division, proportion married, and proportion Caucasian. The first criterion variate was composed of general satisfaction, pay, coworker, and work satisfaction. This pair of composites appeared to reference a set of complex attitude differences at primarily store and division level. Differ-

ences were also found with respect to the racial and marital composition of the work group. The second predictor variate referenced almost exclusively store differences. The criterion variate related to it was composed of promotion, supervision satisfaction, and general satisfaction. Demographic composition related variance was exhausted by the first composite while being redundant to some degree with store division variance. The two canonical correlations were able to account for 21.7% of the variance in attitudes. When all canonical variates are included, 47.9% of the attitude variance is accounted for.

Group level job attitudes and climate. Table 18 summarizes this analysis. Using job attitudes to predict climate at the group level of analysis, the single stable attitude variate was able to account for 46.8% of the climate variance. Due to the asymmetry of the relationship, however, 22.8% of the attitude variance was accounted for by the climate variate. Satisfaction with work, supervision, and coworkers, and general satisfaction were most related to managerial openness-employee participation, and to a lesser extent the physical environment and rationality-structural climate scales. When all variates are considered, 52.4% of the climate variance accounted for by satisfaction measures, while 24.3% of the satisfaction variance is accounted for by the climate measures.

Insert Tables 18 and 19 About Here

To summarize, positional variables were able to account for 29.3% of the attitude variance, group demographic variables, 24.2%, and combined set, 44.2% of the attitude variance. From this information estimates of unique variance were estimated. Thus, 20.0% of the attitude variance is uniquely related to group positional variables and 14.9% by group summary demographic variables. For the prediction of climate, 24.3% of the variance is uniquely related to

positional variables while 14.1% is unique to summary demographic variables at the group level of analysis. Table 19 contains a complete summary of the redundancy coefficients based upon all canonical variates obtained in each analysis. The entries reflect variance in attitudes and climate which was accounted for by variates including structural-positional characteristics, demographics and these combined. From this information we see the relative predictability of attitude and climate from the independent and combined predictor sets at both individual and group levels of analysis.

Discussion

Three questions were addressed in this study. The first was the question of whether climate should be considered at the group or individual level of analysis. The issue of redundancy was also addressed through the evaluation of the relationships observed between climate, satisfaction, and objective characteristics. Additionally, climate was examined empirically as a variable intervening between organizational variables and job attitudes.

In a recent paper, James & Jones (1976) focus on the question of how objective, real world, organizational structures which form the organizational environment influence responses in that environment. The concept of panels suggested by Indik (1968) and elaborated by James and Jones (1976) provide a basis for understanding how these environmental influences affect the work lives of organizational members. Within this model, organizational climate is seen as a "higher order abstraction of lower level constructs" which represents the prevailing conditions in the organizational environment. Thus, these higher-order abstractions are summary cognitions held by individuals. These cognitions exist in each member, and each has an abstraction of the organizational environment in one's own mind. It should be noted that this differs from the Payne et al (1976) and Schneider (1975) conception which views organizational climate as a summary of perceptions across persons. The level at which the summary occurs is clearly different.

The results of the present study at the individual level are consistent with what Schneider & Snyder (1975) have argued. Organizational variables are more closely related to climate (descriptions) than to attitudes (evaluations) while individual characteristics are more closely related to attitudes than to climate. Positional variables were able to account for 15.4% of the climate variance and 11.5% of the attitude variance. Overall, climate was slightly

more predictable then were attitudes, with 22.4% of climate variance and 20.5% of the attitude variance accounted for by combined predictor sets. The individual results are consistent with some previous research on climate (Schneider, 1975) and do approximate the pattern hypothesized by Schneider (1975).

While the individual results appear to be suggestive of an Organizational Position --- Climate --- Job Attitudes relationship at the individual level of analysis, the conceptualization of climate as a group level construct measured by aggregation of individual responses (Payne et al, 1976; Schneider and Snyder, 1975) made it necessary to consider the relationship between the variables previously used at the group level as well.

The results of the group level analyses present a slight change in the pattern of relationships. Positional variables accounted for 33.8% while group demographic characteristics accounted for 23.6% of the climate variance. Unique variance estimates indicate a similar pattern.

From knowledge of distributions and regression we would expect that variance accounted for in group level analyses to exceed that obtained at the individual level. This should be the case since the group data are based on the group mean response to attitude and climate items. Means are more predictable simply because they no longer contain the individual error variance which forms the residual about the regression line. Thus, while the change in magnitude of the variance estimates would be expected, we would not expect a major shift in the pattern of relationships to occur as a result of the use of group means. Such changes should be observed however if the nature of the relationships actually change when we move from one level to another. The most obvious change which might be expected would be simply that very different composites are found at the two levels. Examination of the structure matrices of parallel analyses at the two levels reveals that physical environment and rationality-

structure climate scales have the largest loadings on the first variate regardless of the level of analysis. Managerial-openness and physical environment were most important for the second variate at the group level while the corresponding variate at the individual level was too unstable to interpret. It appears that the same "kind" of climate variance is being predicted regardless of level. Examination of the predictor variates at the two levels indicates the presence of similar patterns of loadings in the corresponding structure matrices. Thus the same predictor variables are important, regardless of the level of analysis.

One explanation for these results lies in the effects of aggregation on a potential host of individual level confounding variables (Blalock 1972). Through aggregation, variance is reduced, and the lost variance should represent the "noise" in prediction at the individual level. In the regression model we would expect an increase in $\underline{R}^2$ as a results of the elimination of the "noise." But under certain assumptions (see Blalock 1972) concerning the nature of the aggregation, we would expect little change in the slope(s) which define the regression line (or plane). It may be that at the individual level we have confounded climate with a variety of unmeasured influences, all of which also influence the prediction of these measures. Through the aggregation process, the net effect of these variables is reduced and the resultant"noise" in prediction is eliminated. When both positional and demographic predictor sets are used simultaneously, the error is further reduced by the larger number of variables which allow for an improved fit. The result is an extremely powerful prediction of climate from the combined predictor sets.

The results suggest that descriptive and evaluative responses to one's work and work environment are not redundant as some have suggested (Guion, 1973; Johannesson, 1973). Descriptive responses, here labeled climate, represent

"E" vectors of individuals' perceptions (or average group perceptions) of the objective environment. Within the Lewinian framework, job attitudes are considered to be a function of both the person or unit (U) and environment (E) as well as the interaction (U x E). The environment (E) is viewed as the perceived environment which can be described and summarized as yielding "climate" measures.

We must emphasize that these results are perhaps a function of the organization, its function, and the particular climate measure which was specifically developed for the study. Further efforts should be made to determine the construct validity of organizational climate using this and other measures. A further caution is in order regarding the use of redundancy indices. The stability of these estimates is, as yet, unknown. The estimates are a function of correlations among criteria, and number of canonical correlations. These in turn are influenced by the N of the sample. When dealing with group data, we are dealing with a rather small sample of units making the usual p values difficult to achieve. Thus these values must be cautiously interpreted.

With these cautions in mind, the reported individual data appear to be consistent with the results obtained by Newman (1974). Individual perceptions of climate as well as aggregated perceptions are more a function of the position in the organization than personal or group characteristics. The greater predictability of climate over attitude suggests that the constructs are related in the manner proposed by several theorists (Schneider 1975, James & Jones, 1976). Climate may still have a place in the organizational researchers conceptual vocabulary.

Footnote

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Reference Notes

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Table 1

Variance Accounted for by Successive Factors

of the 60 Item Climate Questionnaire

Individual Data

Number of Factors	Roots	Percentage of Variance	Cumulative Percentage
1	11.3046	.4592	.4592
2	2.4642	.1001	.5593
3	1.6518	.0671	.6264
4	1.3911	.0565	.6829
5	1.3021	.0529	.7358
6	1.2001	.0487	.7845
7	1.0602	.0430	.8275
8	0.9100	.0369	.8644
9	0.7845	.0318	.8962
10	0.6883	.0279	.9241
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
60	-0.3307	.0000	1.0000

Table 1 (Continued)

Item Loadings on Three Factors

Individual Data

	Factor		
Scale I	I	II	III
1	.40	.08	.12
2	.47	.25	.27
6	.55	.24	.00
18	.48	.25	-.06
21	.49	.16	.14
32	.70	.10	.30
34	.41	.00	.06
35	-.45	-.13	-.28
37	.48	.20	.19
39	-.49	-.17	-.18
44	-.46	-.13	-.11
48	-.50	-.05	-.32
52	-.49	.17	.04
55	.64	.14	.10
59	.52	.27	.09
	I	II	III
Scale 2			
5	.33	.50	.14
7	.29	.49	.07
22	.12	.52	.15

Table 1 (Continued)

28	.03	.48	.14
30	.07	.53	.03
60	.15	.40	.12
	I	II	III
Scale 3			
10	.05	.19	.53
25	.12	.13	.39
29	-.13	.00	-.39
36	.03	.09	.43
42	.08	.11	.47
57	-.11	-.15	-.40
	I	II	III
Unscaled Items			
3	.00	.48	.52
4	.28	.20	.19
8	-.39	.09	-.25
9	.42	.41	.14
11	.38	.25	.28
12	-.27	.09	-.34
13	.00	.48	.52
14	-.11	.37	-.02
15	.19	.38	.23
16	.23	.11	.07
17	.37	.44	.11

Table 1 (Continued)

19	.20	.24	.29
20	.06	.23	.04
23	.34	.20	.18
24	.04	.20	.43
26	-.49	-.12	-.36
27	.41	.42	.26
31	.41	-.05	.35
33	.24	.28	.11
38	.29	.22	.08
40	.41	.42	.21
41	.29	-.06	-.14
43	.35	.22	-.05
45	.26	.14	.19
46	.41	.34	.07
47	-.33	.16	-.19
49	-.40	-.26	-.32
50	.30	.21	.14
51	-.27	.32	.14
53	.26	.35	.18
54	-.25	.06	.13
56	.35	.00	.26
58	.39	.05	.25

Table 2

Interpretation of Factors-Individual Data

Factor 1

Managerial Openness

Item		Loading
1.	There is an easy way to suggest new ideas.	.40
2.	Managers and supervisors treat employees fairly.	.47
6.	Employees participate in making decisions which affect their jobs.	.55
18.	Important decisons are made by those employees closest to the situation.	.48
21.	Employees may speak frankly with their supervisors.	.49
32.	Supervisors know and understand the problems faced by employees.	.57
34.	Employees are encouraged to use their own judgement.	.41
35.	Getting ahead depends upon knowing the right people.	-.45
37.	Supervisors back up their subordinates.	.48
39.	There is not much opportunity for creative thinking.	-.49
44.	Employees have not influence on supervisors.	-.46
48.	Nothing ever comes of good complaints.	-.50
52.	When problems arise, supervisors ask employees for their advice.	.49
55.	There are opportunities for independent thought and action.	.64
59.	Employees participate in developing work methods and job procedures.	.52

Table 2 (Continued)

Factor 2

Rationality - Structure

Item		Loading
5.	Supervisors emphasize quality work.	.50
7.	Efficiency is emphasized.	.49
22.	Work rules are strictly enforced.	.52
28.	Penalties for not following company policies are enforced.	.48
30.	Employees are supervised closely.	.53
60.	Employees are rewarded on the basis of the quantity of their work.	.40

Factor 3

Physical Environment

Item		Loading
10.	The temperature in my work area is comfortable.	.53
25.	Supplies needed for my job are available.	.39
29.	The noise level is disturbing.	-.39
36.	The lighting in my work area is adequate.	.43
42.	The work area is well ventilated.	.47
57.	The work area is crowded.	-.40

Table 3

Variance Accounted for by Successive Factors of the First Item Set (37 Items) of the Original 60 Item Climate Questionnaire

Group Data

Number of Factors	Roots	Percentage of Variance	Cumulative Percentage
1	8.1250	.3531	.3531
2	2.8619	.1244	.4775
3	1.7820	.0774	.5549
4	1.5680	.0681	.6230
5	1.5630	.0679	.6909
6	1.2150	.0528	.7437
7	1.1112	.0483	.7920
8	1.0164	.0441	.8361
9	0.9618	.0418	.8779
10	0.7927	.0344	.9123
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
37	-0.2611	.0000	1.0000

Table 3 (Continued)

Factor Analysis on Group Data

Loadings on First Sample of Items

Climate Scale Item #	Factor Loadings		
	I	II	III
1	0.41	0.43	0.02
2	0.39	0.40	0.25
6	0.53	0.08	0.11
7	0.18	0.07	0.45
8	-0.48	0.06	-0.35
9	0.47	0.07	0.09
10	0.04	0.71	0.27
12	-0.13	-0.01	-0.54
14	-0.05	0.09	0.17
16	0.39	0.23	0.04
18	0.56	0.14	-0.10
20	-0.07	-0.13	-0.45
22	0.00	0.05	0.55
24	0.19	0.29	0.30
25	0.10	0.72	0.01
26	-0.32	-0.35	-0.52
27	0.42	0.42	0.32
28	-0.01	0.21	0.46
29	-0.20	-0.05	-0.30
33	0.33	0.42	0.13
34	0.61	0.00	0.09

Table 3 (Continued)

35	-0.48	-0.24	-0.29
36	0.00	0.45	0.37
37	0.48	0.17	0.46
39	-0.56	-0.43	-0.10
41	0.54	-0.26	-0.16
42	0.17	0.44	0.25
44	-0.53	-0.15	-0.28
45	0.08	0.29	0.03
49	-0.13	-0.24	-0.54
50	0.21	0.41	0.21
51	-0.31	0.57	-0.14
52	0.62	0.14	0.08
54	-0.66	0.31	0.06
55	0.70	0.43	-0.03
58	0.30	0.11	0.20
59	0.62	0.22	0.13

Table 3 (Continued)

Variance Accounted for by Successive Factors of the Second Item Set (37 Items) of the Original 60 Item Climate Questionnaire

Group Data

Number of Factors	Roots	Percentage of Variance	Cumulative Percentage
1	8.4977	.3450	.3450
2	3.4679	.1407	.4857
3	2.0529	.0833	.5690
4	1.7921	.0727	.6417
5	1.5003	.0609	.7026
6	1.2604	.0511	.7537
7	1.1892	.0482	.8019
8	0.9628	.0390	.8409
9.	0.8752	.0355	.8764
10.	0.7698	.0312	.9076
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
37	-0.2555	.0000	1.0000

Table 3 (Continued)

Factor Analysis on Group Data

Loadings on Second Sample of Items

Item Set 2

Climate Scale Item #	Factor Loadings		
	I	II	III
3	-0.03	0.72	0.35
4	0.44	0.48	0.15
5	0.05	0.10	0.68
7	0.11	0.03	0.58
10	0.07	0.75	0.14
11	0.37	0.30	0.45
13	0.02	0.68	0.36
15	0.02	0.28	0.40
17	0.23	0.18	0.55
19	0.16	0.17	0.50
21	0.53	-0.07	0.34
22	-0.10	-0.03	0.72
23	0.45	0.25	0.15
25	0.18	0.61	-0.05
28	0.07	0.17	0.44
30	0.07	0.23	0.45
31	0.62	0.13	0.03
32	0.70	0.10	0.30
34	0.56	0.05	0.06
37	0.51	0.05	0.50
38	0.41	-0.05	0.08
39	-0.59	-0.41	-0.05

Table 3 (Continued)

40	0.30	0.35	0.35
42	0.43	-0.34	-0.01
43	0.07	0.50	0.25
46	0.13	0.23	0.06
47	0.36	0.35	0.19
48	-0.35	-0.07	0.19
50	-0.19	-0.33	-0.39
51	0.16	0.34	0.36
52	-0.36	0.57	0.07
53	0.53	0.15	0.20
55	-0.61	0.27	0.02
56	0.73	0.37	0.01
57	0.49	-0.08	0.31
59	0.35	0.19	0.07
60	0.52	0.25	0.29

Table 3 (Continued)

Results of Varimax Rotation on Group Data

(Item Set 1)

		% Variance Accounted	
	Variance		% Total Variance
Factor 1	5.77	45.21	45.21
Factor 2	3.85	30.18	75.40
Factor 3	3.14	24.60	99.99

Results of Varimax Rotation on Group Data

(Item Set 2)

		% Variance Accounted	
	Variance		% Total Variance
Factor 1	5.51	39.35	39.35
Factor 2	4.30	30.64	69.99
Factor 3	4.20	30.00	99.99

Table 4

Variance Accounted for by Successive Factors of
37 Items Selected from the Total Climate Questionnaire
Group Data

Factor	Roots	% Variance Accounted For	Cumulative Percentage
1	9.6132	.3892	.3892
2	2.8977	.1165	.5057
3	2.0590	.0828	.5885
4	1.6659	.0670	.6555
5	1.3879	.0558	.7113
6	1.2619	.0507	.7620
7	1.1257	.0452	.8072
8	1.0717	.0431	.8503
9	.8822	.0354	.8857
10	.7590	.0305	.9162
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
37	-.2438	.0000	1.0000

Table 4 (Continued)

Results of Varimax Rotation of Three Factors

Derived from reduced item set

Group Data

	Factor	Variance	% Variance	% Total Variance
1.	Managerial-openness	6.85	46.85	46.85
2.	Physical Environment	3.92	26.79	73.64
3	Rationality Structure	3.86	26.36	99.99

Table 4 (Continued)

Factor Loadings of the 37 Items on Three Factors

Group Data

Scale 1	I	II	III
2	.52	.19	.31
6	.54	.04	.19
8	-.49	-.04	-.06
18	.55	.02	.02
21	.61	-.09	.25
23	.47	.25	.13
26	-.47	-.32	.23
31	.67	.02	-.05
32	.71	.07	.27
34	.54	.14	-.03
35	-.45	-.32	-.11
37	.57	.06	.43
39	-.58	-.31	-.02
44	-.58	-.09	-.28
52	.54	.08	.22
55	.74	.29	-.06
56	.50	-.08	.26
58	.37	.20	.00
59	.57	.18	.21

Table 4 (Continued)

	I	II	III
Scale 2			
3	.03	.76	.26
10	.13	.72	.10
25	.22	.59	-.04
36	.03	.51	.38
42	.07	.63	.22
Scale 3			
5	.09	.18	.67
7	.16	.05	.58
15	.08	.26	.47
17	.30	.17	.42
22	-.03	.01	.70
28	.13	.15	.43
30	.15	.10	.46
60	.08	.10	.58
Unscaled Items			
1	.48	.45	.00
9	.30	.07	.29
13	.07	.07	.31
48	-.55	-.45	-.20
49	-.19	-.37	-.39

Table 4 (Continued)

Interpretation of Factors Derived From 37 Items

Selected from the Total Climate Questionnaire

Group Data

Factor 1 - Managerial Openness

Item		Loadings
2.	Managers and supervisors treat employees fairly.	.52
6.	Employees participate in making decisions which affect their jobs.	.54
8.	There is friction among employees	-.49
18.	Important decisions are made by those employees closest to the situation.	.55
21.	Employees may speak frankly with their supervsiors.	.61
23.	There are standard operating procedures for almost all job activities.	.47
26.	The best means of communication is the grapevine.	-.47
31.	The atmosphere is friendly.	.67
32.	Supervisors know and understand the problems faced by employees.	.71
34.	Employees are encouraged to use their own judgement.	.54
35.	Getting ahead depends upon knowing the right people.	.45
37.	Supervisors back up their subordinates.	.57
39.	There is not much opportunity for creative thinking.	-.58
44.	Employees have no influence on supervisors.	-.58
45.	Work privileges are the same in all divisions.	-.55
52.	When problems arise, supervisors ask employees for their advice.	.54
55.	There are opportunities for independent thought and action.	.74
56.	Members of the same work group help one another.	.50
58.	It is easy to get information to and from my coworkers.	.37
59.	Employees participate in developing work methods and job procedures.	.57

Table 4 (Continued)

Factor II - Physical Environment

Item		Loadings
3.	The work area is neat and clean.	.76
10.	The temperature in my work area is comfortable.	.72
25.	Supplies needed for my job are available.	.59
36.	The lighting in my work area is adequate.	.51
42.	The work area is well ventilated.	.63

Factor III - Rationality-Structure

Item		Loadings
5.	Supervisors emphasize quality work.	.67
7.	Efficiency is emphasized.	.58
15.	Job security is based on satisfactory performance.	.47
17.	Employees are encouraged to take pride in their work.	.42
22.	Work rules are strictly enforced.	.70
28.	Penalties for not following company policies are enforced.	.43
30.	Employees are supervised closely.	.46
60.	Employees are rewarded on the basis of the quantity of their work.	.58

Table 5

Canonical Analysis of Positional Characteristics and Climate

Individual Level of Analysis

Canonical Correlations	Cross Validation
n = 382	n = 127
1. .538	1. .369 ($p < .001$)
2. .365	2. .23 ($p < .01$)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates		
	I	II	I	II	
Managerial Openness	-.032	.926	-.000	.339	
Rationality Structure	-.505	.254	-.272	.089	
Physical Environment	-.729	.682	-.392	.248	
		$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.076	.061	.01639

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .137$$

Predictor Variables	Criterion Variates		Predictor Variates	
Store*	.346	.256	.644	.705
Division*	.415	.161	.774	.447
Supervisory/Non-supervisory	-.032	.212	-.059	-.582

* Dummy Coded Variable

Table 6

Canonical Analysis of Demographic

Characteristics and Climate - Individual Level of Analysis

Canonical Correlations	Cross Validation
n = 331	n = 120
1. .433	1. .278 ($p < .01$)
2. .251	2. .088 (NS)

Structure Matrix

Criterion Variables	Criterion Variate	Predictor Variate
Managerial Openness	.016	.006
Rationality-Structure	-.491	-.217
Physical Environment	-.715	-.310

$$R^2_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .047$$

Predictor Variables	Criterion Variate	Predictor Variate
Age	-.176	-.407
Sex	.300	.692
Married/Single	.077	.177
Education	.030	-.070
Urban Rural	.001	.003
Dependents	-.176	-.406
SES	-.042	-.099
Father's Occupation	-.007	-.017
Father's Education	-.058	.134
Tenure	-.108	-.25
Race*	.099	.229

*Denotes dummy coded variable

Table 7

Canonical Analysis of Demographics and Positional Characteristics and Organizational Climate - Individual Level of Analysis

Canonical Correlations	Cross Validation
n = 325	n = 108
1. .605	1. .285 ($p < .01$)
2. .443	2. .160 ($p < .10$)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
Managerial Openness	.011	.983	.006	.436
Rationality-Structure	-.524	.434	-.317	.192
Physical Environment	-.699	.674	-.423	.299
	$\sum_{j=1}^{Mp} L^2_{jk/Mp}$	=.093		.105

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .198$$

Predictor Variables	Criterion Variates		Predictor Variates	
Store*	.325	.244	.536	.549
Division*	.435	.155	.718	.349
Supervisory/Non-supervisory	-.027	-.226	-.045	-.508
Age	-.171	.047	-.283	.107
Sex	.294	.009	-.485	.020
Married/Single	.084	-.026	.139	-.058
Education	.026	-.082	.043	-.185
Urban-Rural	.010	-.112	.017	-.254

Table 7 (Continued)

Dependents	-.181	-.089	-.299	-.201
SES	-.035	.065	-.059	.148
Father's Occupation	.000	.083	.006	.188
Father's Education	.070	.032	.116	.074
Tenure	-.121	.071	-.200	.160
Race*	.118	.115	.195	.260

*Denotes dummy coded variables

Table 8

Canonical Analysis of Positional Characteristics and Job Attitudes
Individual Level of Analysis

Canonical Correlations		Cross Validation	
n = 382	1. .539	n = 129	1. .292 ($p < .01$)
	2. .448		2. .157 ($p < .10$)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
JDI Work	-.082	-.583	-.045	-.061
JDI Supervision	.345	-.557	.186	-.249
JDI Promotion	.427	-.253	.230	.114
JDI Pay	-.452	-.571	-.244	.256
JDI Coworker	-.239	-.504	-.129	.226
Exp. Motivation	-.078	-.280	-.042	.125
Job Involvement	.298	-.590	.160	.264
Focus of Motivation	.188	-.491	.101	.220
General Satisfaction	.259	-.341	-.139	.153
		$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.025	.046
		$\overline{R^2_{p-c}} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.071	

Predictor Variables	Criterion Variates		Predictor Variates	
Store*	.468	.272	.867	.608
Division*	.216	.317	.402	.709
Supervisory/Non-supervisory	-.116	.173	-.215	.387

* Denotes Dummy Coded Variable

Table 9

Canonical Analysis of Demographic Characteristics and Job Attitudes - Individual Level of Analysis

Canonical Correlations		Cross Validation	
n = 331	1. .532	n = 120	1. .279 ($p < .01$)
	2. .378		2. -.035 (Ns)

Structure Matrix

Criterion Variables	Criterion Variate	Predictor Variate
JDI Work	.466	.248
JDI Supervision	.209	.111
JDI Promotion	-.255	-.136
JDI Pay	.466	.248
JDI Coworker	.106	.057
Exp. Motivation	.604	.321
Job Involvement	.559	.298
Focus of Motivation	.496	.264
General Satisfaction	.444	.236

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .052$$

Predictor Variables	Criterion Variate	Predictor Variate
Age	.394	.740
Sex	-.199	-.375
Married/Single	-.309	-.580
Education	-.082	-.154
Urban Rural	-.171	-.323
Dependents	.174	.327
SES	-.171	-.265

Table 9 (Continued)

Father's Occupation	-.125	-.235
Father's Education	.105	.197
Tenure	.313	.588
Race*	.271	.510

*Denotes Dummy Coded Variable

Table 10

Canonical Analysis of Demographic and Positional Characteristics and Job Attitudes - Individual Level of Analysis

Canonical Correlations		Cross Validation	
n = 325	1. .639	n = 108	1. .338 ($p < .01$)
	2. .572		2. .162 ($p < .10$)
	3. .453		3. .005 (Ns.)
	4. .411		4. .04 (Ns)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
JDI Work	.341	.565	.218	.323
JDI Supervisions	-.135	.706	-.086	.404
JDI Promotions	-.457	.343	-.292	.196
JDI Pay	.473	.282	.303	.161
JDI Coworkers	.241	.157	.154	.090
Exp. Motivation	.295	.487	.188	.278
Job Involvement	.127	.705	.082	.403
Focus of Motivation	.149	.562	.095	.322
General Satisfaction	.389	.244	.249	.139
	$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ =		.040	.077
	$\overline{R^2_{p-c}} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp}$ =		.117	

Predictor Variables	Criterion Variates		Predictor Variates	
Store*	.471	.319	.737	.558
Division*	.235	.277	.367	.485
Supervisory	.014	-.172	.022	-.301
Age	.317	.209	.496	.366

Table 10 (Continued)

Sex	-.133	-.209	-.208	-.365
Married/Single	-.259	-.178	-.406	-.310
Education	-.005	-.136	-.007	-.237
Urban/Rural	-.086	-.099	-.135	-.173
Dependents	.136	.100	.213	.175
SES	-.129	-.032	-.201	-.056
Father's Occupation	-.130	-.003	-.204	-.006
Father's Education	.158	-.040	.037	.277
Tenure	.209	.090	.368	.365
Race*	.196	.153	.306	.268

*Denotes Dummy Coded Variables

Table 11

Canonical Analysis of Climate and Job Attitudes

Individual Level of Analysis

Canonical Correlations		Cross Validation	
n = 396	1. .783	n = 132	1. .701 ($p < .01$)
	2. .338		2. .371 ($p < .01$)
	3. .187		3. -.019

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
Managerial Openness	-.964	-.212	-.775	-.071
Rationality-Structure	-.655	-.187	-.513	-.063
Physical Environment	-.798	.592	-.625	.200
	$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.395		.016

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .407$$

Predictor Variables	Criterion Variates		Predictor Variates	
JDI Work	-.593	.019	-.757	.056
JDI Supervision	-.607	-.100	-.776	-.298
JDI Promotion	-.518	-.088	-.662	-.260
JDI Pay	-.321	.220	-.410	.651
JDI Coworkers	-.567	.061	-.724	.180
Experienced Motivation	-.271	-.070	-.346	-.207
Job Involvement	-.272	-.061	-.347	-.182
Focus of Motivation	-.194	-.112	-.248	-.332
General Satisfaction	-.482	.130	-.615	.384
	$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.196		.011

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .203$$

Table 12

Canonical Analysis of Positional Characteristics and Organizational Climate - Group Level of Analysis

Canonical Correlations	Cross Validation
n = 87	n = 29
1. .719	1. .372 ($p < .05$)

Structure Matrix

Criterion Variables	Criterion Variate	Predictor Variate
Managerial Openness	-.039	-.027
Physical Environment	.811	.583
Rationality Structure	.514	.369

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .159$$

Predictor Variables	Criterion Variate	Predictor Variate
Store*	.434	.603
Division	.570	.793
Proportion Supervisory	.209	.150

*Denotes Dummy Coded Variables

Table 13

Canonical Analysis of Group Demographic Characteristics and Organizational Climate- Group Level of Analysis

Canonical Correlations		Cross Validation	
n = 87 groups	1. .556	n = 29	1. .261 ($p < .20$)
	2. .499		2. .525 ($p < .01$)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
Managerial Openness	.147	-.936	.082	-.468
Physical Environment	.878	-.464	.489	-.232
Rationality Structure	.674	-.245	.375	-.122
		$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.128	.095
		$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.223	

Predictor Variables	Criterion Variates		Predictor Variates	
Mean Age	.358	-.048	.644	-.096
Proportion Male	-.286	-.072	-.515	-.146
Proportion Married	-.312	.045	-.561	.090
Proportion Caucasian	.157	-.047	.282	-.094
Mean Education	-.011	-.171	-.019	-.342
Mean Urban-Rural	-.075	.285	-.135	.570
Mean Dependents	.308	.108	.554	.218
Mean Father's Occupation	-.181	-.141	-.326	-.282
Mean Tenure	.233	-.154	.419	-.309

Table 14

Canonical Analysis of Demographic
and Positional Characteristics and Climate
Group Level of Analysis

Canonical Correlations		Cross Validation	
n = 87	1. .802	n = 29	1. .28 ($p < .12$)
	2. .689		2. .30 ($p < .10$)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
Managerial Openness	.169	.906	.135	.624
Physical Environment	.920	.387	.738	.267
Rationality Structure	.568	.156	.456	.108
		$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.257	.157
		$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp}$ =	.414	

Predictor Variables	Criterion Variates		Predictor Variates	
Store*	.457	.406	.570	.590
Division*	.544	.313	.678	.454
Proportion Supervisory	.081	-.317	.101	-.459
Mean Age	.374	.020	.466	.029
Proportion Male	-.266	.100	-.332	.145
Proportion Married	-.317	-.018	-.395	-.027
Proportion Caucasian	.151	.031	.189	.045
Mean Education	.011	.173	.013	.251

Table 14 (Continued)

Mean Urban-Rural	-.075	-.272	-.093	-.394
Mean Dependents	.288	-.137	.359	-.198
Mean Father's Occ. Level	-.153	.159	-.191	.231
Mean Tenure	.242	.133	.302	.193

Table 15

Canonical Analysis of Positional Characteristics and Job Attitudes

Group Level of Analysis

Canonical Correlations			Cross Validation		
n = 37	1.	.806	n = 29	1.	.418 ($p < .05$)
	2.	.681		2.	.198 ($p < .20$)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
JDI Work	.306	.495	.247	.338
JDI Supervision	-.016	.577	-.013	.394
JDI Promotion	-.400	-.165	-.323	-.113
JDI Pay	.579	-.326	.467	-.222
JDI Coworker	.383	.386	.309	.263
Exp. Motivation	.237	.293	.191	.199
Job Involvement	.101	.653	.081	.445
Focus of Motivation	.123	.637	.099	.434
General Satisfaction	.436	.073	.352	.050
			$\sum_{j=1}^{Mp} L^2_{jk/Mp} =$ .067	.092
		$R^2_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} =$ .159		

Predictor Variables	Criterion Variates		Predictor Variates	
Store*	.675	.366	.838	.536
Division*	.436	.435	.541	.638
Supervisory/Non-supv.	-.023	-.347	-.029	-.509

*Denotes Dummy Coded Variables

Table 16

Canonical Analysis of Group Demographic Characteristics and Attitudes

Group Level of Analysis

Canonical Correlations		Cross Validation	
n = 87	1. 791	n = 29	1. .468($p < .01$)
	2. .575		2. .196($p < .20$)

Structure Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
JDI Work	-.466	.618	-.369	.355
JDI Supervision	-.367	.025	-.291	.014
JDI Promotion	.225	.388	.178	.224
JDI Pay	-.431	.049	-.341	.028
JDI Coworkers	-.518	-.128	-.410	-.073
Exp. Motivation	-.562	.258	-.445	.148
Job Involvement	-.413	.347	-.327	.200
Focus of Motivation	-.571	.281	-.452	.162
General Satisfaction	-.583	.345	-.462	.199
		$\sum_{j=1}^{Mp} L^2_{jk/Mp}$	=.139	.034

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .173$$

Predictor Variables	Criterion Variates		Predictor Variates	
Mean Age	-.259	.189	-.328	.329
Proportion Male	.441	.033	.557	.056
Proportion Married	.474	.287	.599	.499

Table 16 (Continued)

Proportion Caucasian	-.421	-.015	-.532	-.026
Mean Education	-.288	-.106	-.364	-.184
Mean Urban-Rural	.236	-.154	.298	-.268
Mean Dependents	-.444	-.212	-.562	-.368
Mean Father's Occ. Level	.332	.136	.420	.237
Mean Tenure	-.347	.312	-.439	.542

Table 17

Canonical Analysis of Demographic and

Positional Characteristics and Job Attitudes

Group Level of Analysis

Canonical Correlations			Cross Validation		
n = 87	1.	.854	n = 29	1.	.277 ($p < .20$)
	2.	.765		2.	.081 (NS)

Variance Matrix

Criterion Variables	Criterion Variates		Predictor Variates	
JDI Work	-.488	-.152	-.418	-.116
JDI Supervision	-.226	-.516	-.193	-.395
JDI Promotion	.291	-.566	.249	-.433
JDI Pay	-.536	-.147	-.458	-.113
JDI Coworker	-.540	-.268	-.462	-.205
Exp. Motivation	-.425	-.246	-.363	-.188
Job Involvement	-.244	-.207	-.208	-.158
Focus of Motivation	-.308	-.447	-.263	-.342
General Satisfaction	-.600	-.539	-.513	-.413
			$\sum_{j=1}^{Mp} L^2_{jk/Mp}$ = .133	.084

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .217$$

Predictor Variables	Criterion Variates		Predictor Variates	
Store*	.642	.541	.751	.706
Division*	.439	.247	.514	.322

Table 17 (Continued)

Proportion Supervisory	.114	.124	.134	.162
Mean Age	-.261	-.072	-.304	-.094
Proportion Male	.367	.127	.429	.167
Proportion Married	.448	.077	.524	.101
Proportion Caucasian	-.448	-.184	-.524	-.241
Mean Education	-.264	-.003	-.309	-.004
Mean Urban-Rural	.220	.111	.257	.232
Mean Dependents	-.381	-.093	-.446	-.123
Mean Father's Occ. Level	.299	-.023	.350	-.029
Mean Tenure	-.336	.006	-.394	.008

*Denotes Dummy Coded Variable

Table 18

Canonical Analysis of Climate and Job Attitudes

at Group Level of Analysis

Canonical Correlations			Cross Validation		
n = 87	1.	.839	n = 29	1.	.707
	2.	.642		2.	-.087
	3.	.543		3.	-.006

Structure Matrix

Criterion Variables	Criterion Variate	Predictor Variate
Managerial Openness	-.934	-.783
Physical Environment	-.818	-.686
Rationality-Structure	-.675	-.567

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .468$$

Predictor Variables	Criterion Variate	Predictor Variate
JDI Work	-.728	-.867
JDI Supervision	-.638	-.713
JDI Promotion	-.282	-.336
JDI Pay	-.224	-.267
JDI Coworkers	-.578	-.689
Experienced Motivation	-.325	-.388
Job Involvement	-.348	-.415
Focus of Motivation	-.183	-.218
General Satisfaction	-.633	-.754

$$\overline{R^2}_{p-c} = \sum_{k=1}^{Mc} \sum_{j=1}^{Mp} L^2_{jk/Mp} = .228$$

Table 19

Summary of Canonical Analyses:

Proportion of Response Variance Accounted for

by all Linear Combinations of the Predictor Sets

Individual Level of Analysis	Criteria	
	Climate	Job Attitudes
Positional characteristics	.154 (.135)	.115 (.114)
Demographic characteristics	.089 (.070)	.091 (.090)
Positional & demographic characteristics	.224	.205

Group Level of Analysis	Criteria	
	Climate	Job Attitudes
Positional characteristics	.338 (.243)	.293 (.200)
Group demographic characteristics	.236 (.141)	.242 (.149)
Positional & group demographic characteristics	.479	.442

Note: Estimates of unique variance accounted for appear in parenthesis.

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